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ABSTRACT

Based upon studies conducted in the U. S. and on data from other countries on the method used to provide dental care, increased dental productivity can be achieved through greater use of dental auxiliaries and by the use of expanded function auxiliaries. Dental practice laws should be made less restrictive to enable dentists to more fully utilize auxiliaries in their dental practice. Further, states should not promote restrictive laws regarding the qualifications for becoming a dental auxiliary. States should also reexamine the restrictions currently placed on the ability of a dentist to provide information regarding his practice. Dental practice laws should be modified to permit wide-scale demonstration projects on the feasibility of the school dental nurse program as performed in other countries. Although not directly related to increasing the productivity of a single dentist but instead related to the productivity of the oral health system, the use of flouridated water supplies should be encouraged. Allowing consumers to have greater access to the administration of flourides, and using lesser trained persons will achieve greater returns in terms of reducing unfilled needs than more expensive programs that attempt to increase the supply of highly trained dentists. (Arthor/PG)

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Health Manpower Policy Discussion Paper Series

INCREASING DENTAL OUTPUT
A REVIEW OF PRODUCTIVITY

by Paul J. Feldstein

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OUTLINE

		Page
I.	Background: The Supply of Dental Care	1
	A. The Stock of Dentists.	1
	B. The Production of Dental Services.	2
II.	Increased Dental Productivity from Increased Use of Auxiliaries	3
	A. Past Trends in Dental Productivity	3
	B. Potential Increases in Dental Productivity through Use of Expanded Function Auxiliaries .	6
III.	Restraints on the Full Use of Auxiliary Personnel.	13
	A. Dental Practice Acts	13
	B. State Dental Examining Boards.	14
	C. Practitioner Attitudes	15
IV.	Needed Research on Dental Productivity	15
V.	Policy Implications Regarding Increased Dental Productivity	16

I. Background: The Supply of Dental Care

A. The Stock of Dentists:

There are approximately 120,000 dentists in the United States or in terms of population per dentist, 1685 persons per dentist.[1] The number of active dentists are estimated to be approximately 104,000 or a population:dentist ratio of 1967:1. The number of active dentists has increased 33 per cent between 1950 and 1970, or 1.44 per cent per year.

Changes in the stock of dentists could occur as a result of deaths and retirements or by additions as a result of the production of new graduates and by the inmigration of foreign trained dentists. In 1970, 373 foreign dentists immigrated to the U.S. However, except for Canadian trained dentists, state licensing boards do not permit foreign trained dentists to practice unless they have undergone additional training. It is thus not possible to determine how many of the foreign trained dentists were Canadian or how many actually completed their additional training and were permitted to practice. Increments to the stock of U.S. dentists by foreign trained dentists are thus likely to be small.

There were 53 dental schools in the U.S. in 1970 and these produced 3500 dental graduates in that year. It is estimated that by 1975 there will be 57 dental schools with an annual production of 4270 graduates. The

major determinant of additions to the stock of dentists therefore is the number of dental schools and their number of spaces. The demand for spaces by prospective students has continually exceeded the available spaces and in recent years the per cent of applicants enrolled has dropped to 42 per cent (1969-1970). Thus the constraint on increases in the stock of dentists is the requirement--in addition to examination and licensing--of having taken a dental education in an approved school, with minimum educational requirements. Since the annual increase in dental graduates has been 1.76 per cent (1955-1970), any further increases in the output of dental care would have to come from increases in the productivity of existing dentists.

B. The Production of Dental Services

More than 75 per cent of dentists are non-salaried and in solo practice. Although the per cent of dentists that are specialists are increasing (3.1 per cent in 1955 and 8.5 per cent in 1969), more than 85 per cent of the practicing dentists are still general practitioners. The predominant form of reimbursement is fee-for-service.

For purposes of analyzing the dental sector it is useful to view the dentist as a "firm" producing dental services. The factor inputs, broadly defined, include the dentist's own time, the time of any auxiliary personnel, equipment such as number of chairs and type of drill, as

well as office expenses and dental supplies. In the production of dental services, the dentist must work within a framework of technology which constrains his possible choices of combinations of factor inputs. "Technology," broadly defined, can be taken to cover the methods known to the dentist, the type of equipment available, and the duties which his assistants are allowed to perform. In the short run (the time in which the number of dentists are fixed) increased output of dental services can come from reorganization of the methods of dental practice or from increased productivity of the individual dental practices. To date, there is little, if any, information on the effect of different methods of dental practice on dental output.

The main cause of past increases in dental productivity, and the likely source of future increases, lies in increased use of dental auxiliaries. Dentist hours worked have decreased, therefore increased production can most rapidly occur by hiring more auxiliaries to do "standard" auxiliary functions and/or delegating tasks traditionally performed by the dentist to the auxiliaries. This paper will concentrate on these labor intensive approaches toward increasing productivity.[2]

II. Increased Dental Productivity from Increased Use of Auxiliaries

A. Past Trends in Dental Productivity

Several measures of output have been used to de-

scribe the increase in dental productivity: dental visits, consumer expenditures on dental care, and gross incomes of dentists.

When visits are used as the measure of output, the increase in productivity (visits per dentist) from 1950 to 1970 has been 1.6 per cent per year. (When a shorter period is used, 1955 to 1970, the annual per cent increase is lower, 1.2 per cent.) Over the same time period, the number of auxiliaries has increased from 1.04 to 1.40 per dentist, or an increase of 1.5 per cent per year (1.1 per cent per year from 1955). The annual increase in dental productivity and in use of auxiliaries appears to be closely related. A more accurate indication of the contribution of auxiliaries to increased number of dental visits is shown in Table 1. This table shows, for each of three years for which the data are available, the number of visits per dentist with different numbers of dental auxiliaries. According to this table, with increased use of auxiliaries, a dentist can increase his output from 20 to 40 per cent.

When consumer expenditures on dental care (adjusted by the dental care price index) is used as the measure of dental output, then from 1950 to 1970 the annual increase in dental productivity has been 3.1 per cent. The larger annual per cent increase in dental productivity when deflated consumer expenditures on dental care are used as

TABLE 1

Average Annual Patient Visits per Dentist by Number of Auxiliary Personnel Employed

Year[a]	Auxiliaries Employed (Full-time Personnel Only)[f]				
	0	1	2	3	4 or more
1958[c]	2272	3014	3174	3929	b
1961[d]	2003	2968	3706	4790	b
1964[e]	2355	3015	3946	4409	6170

[a]Data incomplete, unavailable, or unreliable for 1950, 1953, 1956, and 1968, Surveys of Dental Practice.

[b]Too few Survey replies for reliable statistics.

[c]Source: American Dental Association, The 1959 Survey of Dental Practice, p. 47.

[d]Source: American Dental Association, The 1962 Survey of Dental Practice, p. 45.

[e]Source: American Dental Association, The 1965 Survey of Dental Practice, p. 35.

[f]Auxiliaries include dental technicians, dental hygienists, dental assistants, and secretaries/receptionists.

the measure of dental output is possibly a result of the fact that the average dental visit has changed over time and that this change is incorporated in the expenditure data but not the visit data.

The third measure of dental output that was used was the gross incomes of dentists. If dentists employed different numbers of auxiliaries and the price of dental care was similar among the dentists, then differences in their gross incomes would represent differences in output. For each of the years analyzed, gross incomes per dentist increased with increased numbers of auxiliaries. In more recent years, however, the increases in gross income for each dentist-auxiliary combination have been lower.

When gross income per dentist was used to measure the increased productivity over time, it was found that gross income per dentist per hour (adjusted for dental price increases) increased 3.1 per cent annually from 1955 to 1970.

Regardless of whether the output measure is visits, expenditures on dental care or gross incomes of dentists, it is apparent that dentists could achieve substantial increases in productivity (1.6 to 3.1 per cent per year) by employing additional auxiliary personnel.[3]

B. Potential Increases in Dental Productivity through Use of Expanded Function Auxiliaries

There is mounting evidence that the use of "ex-

panded function auxiliaries" (EFA's) can lead to appreciable increases in dental productivity. In several foreign countries, notably New Zealand, EFA's are being effectively utilized on a large scale. The general conclusions to be drawn from this evidence and foreign experiences are: (1) auxiliaries can be trained, in a relatively short time, to perform many functions traditionally performed by the dentist, at the same level of quality provided by the dentist; and (2) the output of dental services provided by the dentist can be increased through the employment of EFA's.[4]

1. Domestic Civilian Studies

In a study conducted in Louisville, Kentucky, by the Division of Dental Health, dental assistants received 48 weeks training to perform additional tasks. Using a "procedures completed per day" measure of output, a team of one dentist and four EFA's was 133 per cent more productive than a "traditional" team of one dentist, one chairside assistant, and other "office" help. Using a "time unit" measure of work, the EFA team increased productivity by 123 per cent over the "traditional" team. A team of one dentist and three EFA's treated 62 per cent more patients, performed 84 per cent more procedures, and accomplished 80 per cent more time units than did the "traditional" team. The work performed by the EFA's was highly satisfactory from a professional viewpoint, and

the patients treated indicated a high degree of satisfaction with the work provided.[5]

A continuing study conducted at the University of Alabama involved the delegation of expanded functions to "dental therapists," high school graduates who were given two years training in the performance of various intraoral tasks. The therapists were found to perform as well as dentists in inserting and finishing amalgam and silicate restorations, inserting temporary fillings, and placing matrix bands for amalgam restorations. In fact, the quality of work done by the therapists was often found to be <u>better</u> than that rendered by advanced dental students.[6-8]

In a study conducted by the Department of Indian Health, dental health teams consisting of one dentist and two assistants were organized. The assistants were Indian women who received eight weeks training. including one week on "clinic management." The assistants selected, contoured, placed, and removed matrix bands, placed alloys, and carved Class II restorations; and the quality of their work was found to be comparable in quality to that of dentists.[9]

A program conducted by the Philadelphia Department of Public Health utilized "technotherapists," former dental assistants who received six months additional training. The technotherapists then performed many technical ser-

vices traditionally handled by dentists, including virtually everything in the area of operative dentistry except the injection of local anesthetic, the cutting of cavity preparations, and certain other functions. The work of the technotherapists was found to be highly satisfactory in comparison to that done by dentists, and even the quality of work performed by the dentists themselves was found to be upgraded, due perhaps to the "competition" provided by the technotherapists. Teams of one dentist, three technotherapists, two assistants, and one clerk were found to be capable of doing as much work as four dentists each working with one chairside assistant. This productivity increase is an overstatement in that the functions performed extended only to examinations, cleanings, and fillings; but it is an understatement in that the teams were forced to use a facility not well-suited to efficient operation of the team.[10]

2. Military Studies

In an experiment conducted at Great Lakes Naval Training Center, dental "technicians" received 23 weeks training on dental anatomy, dental materials, oral hygiene, applying rubberdams, inserting cavity liners or bases, placing matrix bands, and inserting and finishing amalgam and silicate fillings. The quality of work done by the technicians in performing these functions was deemed to be "as satisfactory as conventional methods." The combi-

nation of one dentist and four technicians, working at three chairs, was found to be highly efficient. Some dentists increased productivity by over 80 per cent, and treated twice as many patients, using this set-up as compared to the conventional "one-chair" operation.[11,12]

A program conducted in the Canadian military took experienced "clinical technicians" (the counterparts of civilian dental hygienists) and gave them four weeks training on an individualized basis in expanded functions. The training was in functions similar to those performed by the "technicians" in the Great Lakes study, plus training in certain simple standard procedures in prosthodontics and periodontics. When the technician was added to a "team" of one dentist, one chairside assistant, and one roving assistant, team productivity increased 99.1 per cent, of which 61.7 per cent was attributed directly to the technician's participation and 37.4 per cent to increased productivity by the other members of the team. Other teams, composed of one dentist and one technician, accomplished on the average in a 6.5 hour day the same amount of work done by a dentist working alone in 10.5 hours--a 61.5 per cent increase. (Three treatment rooms were found necessary to effectively utilize these "two-man" teams.) Further, the dentists involved were able to make more productive use of their time due to the technicians' participation. The per cent of his time

which the average dentist spent actually operating increased from 49.8 per cent to 75.0 per cent; and the dentist spent less time idle or doing "non-productive" work such as greeting patients, etc.[13]

3. Experiences in Other Countries

In several foreign countries, dental care providers, faced with a shortage of dental manpower, have turned to expanded function auxiliaries with successful results. The leading example is the New Zealand dental nurse program. The nurses are trained to provide initial examination and charting, prophylaxis, topical application of fluorides, operative dentistry for deciduous and permanent teeth, extraction of teeth, and dental health education. When trained, each nurse becomes responsible for the dental health care of approximately 500 school children. Groups of 80 nurses are monitored and supervised by one dentist. Surveys indicate that the program has resulted in better oral health for patients, and that the work done by the nurses has been of high quality. Use of this system has made possible the provision of a much greater supply of dental care to the people of New Zealand than would otherwise be available, given their supply of dentists.[14]

A survey conducted by Leatherman found that "there has been a marked increase in the training and use of the New Zealand-type nurses in the developing countries and Australia." In 1960, six countries were using New Zealand-

type nurses in public dental services, while by 1968, fourteen countries were utilizing this auxiliary. The nurses are typically trained for two years, and perform intraoral functions including regular examination, prophylaxis, filling of teeth, extraction of teeth under local anesthesia, and radiographic examination. Leatherman forecasts that, in the future, these nurses will be allowed to work with less and less direct supervision by a dentist. Leatherman also predicted more and more delegation of comprehensive duties to dental hygienists.[15]

Arnold has concluded that the delegation of certain functions to a properly trained clinical chairside assistant would save fifty per cent of the dentists' time normally needed for a filling. These functions include taking impressions for study casts, placing and removing rubberdams and matrix bands, condensing and carving amalgam restorations in previously-prepared teeth, placing of silicate and acrylic restorations in previously-prepared teeth, applying the final finish and polish to the above-listed restorations, and placing and removing temporary restorations.[16] The World Health Organization has advised nations with dental health programs to expand their dental services by the utilization of auxiliary personnel (including chairside assistants, laboratory technicians, hygienists, and EFA's) and the development of dental health teams.[17]

It is thus apparent that the dental "firm" can increase its output of services by greater use of auxiliary personnel, especially through the delegation to auxiliaries of tasks traditionally performed by the dentist. Most of the demonstrations in this country and the foreign experiences with EFA's support the finding of more services per dentist through greater use of dental auxiliaries. The dentist is thus freed for other, more complicated tasks, and the total amount of services produced per dentist is increased, with no reduction in quality of care.

To date, however, certain restraints have prevented the full utilization of EFA's in this country.

III. Restraints on the Full Use of Auxiliary Personnel

A. Dental Practice Acts

The dental practice acts in all states have for a long time constituted a severe restraint on the delegation of expanded functions to auxiliaries. This is particularly true with respect to dental hygienists. The typical, traditional statute defines the functions of hygienists as follows:

> Such licensed hygienists may remove calcareous deposits, accretions, and stains from the teeth, and may prescribe or apply ordinary mouthwashes of soothing character, but shall not perform any other operation on the teeth, mouth, or tissues of the oral cavity, or administer any therapeutic remedies to diseased portions of teeth or their surrounding tissues.[18]

The hygienist is thus legally allowed to perform only functions which are far less complex than those for which she has been trained. Delegation of functions is further inhibited by the legal requirement in virtually all states, that any work performed by the hygienist be done under the "direct supervision" of the dentist. Such dental practice acts therefore limit the use of auxiliary personnel, and so constitute a limitation on potential increases in output.

B. State Dental Examining Boards

State dental examining (licensing) boards apparently have substantial powers to define the functions of auxiliaries. This is particularly true with respect to assistants, whose functions are typically not defined in the statutes themselves.[19] To the extent that the definition of auxiliary functions become a matter of discretionary power of state boards, rather than of inflexible statutory requirements, greater delegation of functions to auxiliaries should be possible. However, since many licensing boards are composed of older practitioners, and are thus more conservative,[20] the "liberalizing" effect of this change may not be very great. Johnson and Bernstein concluded that, despite revised dental practice acts in almost half the states, "It appears that very few additional functions have been delegated to dental hygienists commensurate with their level of training . . . . It appears

dental assistants are still not allowed to do a considerable number of functions that they should be able to perform in line with their experience and education."[21]

C. Practitioner Attitudes

The attitudes of dental practitioners also constitute a barrier to the use of EFA's. One survey of practitioners concluded that many dentists are reluctant to assign technical tasks to auxiliaries because they feel technical competence to be the most important trademark of a fine practitioner. The surveyed dentists also disliked having to perform supervisory functions or to teach new personnel, and felt that it was necessary to deal with patients personally in order to maintain good "dentist-patient" relationships.[22] Hall's study found similar negative attitudes toward auxiliaries among Canadian dentists.[23]

It appears, however, that younger practitioners have more liberal attitudes toward the utilization of auxiliaries. The Brown study found that younger practitioners and recent graduates are more likely to delegate tasks to assistants than are older practitioners.

IV. Needed Research on Dental Productivity

Although it would appear that the measurement of output in the dental sector is less complicated than the measurement of output in the medical care sector, it is still not without its problems. Future studies of dental

productivity should examine the different output mixes that are produced when different combinations of dentists and auxiliaries are used. Hoped for productivity gains when using more auxiliaries might instead result in a greater number of visits that are performed primarily by auxiliaries. The output (visit) mix might thus be different than when a greater proportion of the dentist input is used.

Further research on dental productivity should also seek to determine more precisely the contribution to dental output of each type of dental auxiliary and of different numbers of such auxiliaries. Estimates of the effect on dental productivity of the non-labor inputs and technical change are also needed. With regard to expanded function auxiliaries, what further tasks, now handled by the dentist, can auxiliaries perform and at what level of training? Also, how can practitioner attitudes on the use of auxiliaries and especially expanded function auxiliaries be changed?

V. Policy Implications Regarding Increased Dental Productivity

(1) Based upon studies conducted in this country and on data from other countries on the method used to provide dental care, increased dental productivity can be achieved through greater use of dental auxiliaries (performing under current restrictions) and by the use of expanded function auxiliaries (i.e., a loosening of

restrictions to enable auxiliaries to perform more tasks). Dental practice laws and regulations promulgated by state dental examining boards should be made less restrictive to enable dentists to more fully utilize auxiliaries in their dental practice.

(2) Further, states should not promote restrictive laws regarding the qualifications for becoming a dental auxiliary. Such restrictions will merely decrease the likely supply of auxiliaries and increase their cost to the dentist.

(3) States should also re-examine the restrictions currently placed on the ability of a dentist to provide information regarding his practice. Without being able to provide such information to potential consumers, new dentists find it difficult to develop their practices and existing dentists find it difficult to expand their volume to take advantage of the increased productivity of dental auxiliaries.

(4) Dental practice laws should be modified to permit wide-scale demonstration projects on the feasibility of the school dental nurse program as performed in other countries. Further, modifications of dental practice acts should permit expanded function auxiliaries to provide dental care in rural and low-income areas that are not currently served by dentists. Such dental personnel could be under the indirect supervision of dentists.

(5) Although not directly related to increasing the productivity of a single dentist but instead related to the productivity of our oral health system, the use of fluoridated water supplies should be encouraged. There have been numerous studies on the reduction in caries among children and the potential savings of having fluoridation. Approximately 70 per cent of our central water supplies are still not fluoridated. There are also several alternative methods available for achieving the results of fluoridation such as the use of fluoride pills and topical fluorides. Allowing consumers to have greater access to such measures, particularly the administration of topical fluorides, by using lesser trained persons, will achieve greater returns in terms of reducing unfilled needs, than more expensive programs that attempt to increase the supply of highly trained dentists.

NOTES

[1]The data on the supply of dental services are based upon Paul J. Feldstein, Financing Dental Care: An Economic Analysis, D. C. Heath & Co., 1973.

[2]Maurizi attempted to measure the annual per cent increase in dentist productivity attributable to technical change over time. He compared the change in dentist time-input required to perform various types of services between 1943 and 1950 and between 1943 and 1958. The result of his calculations were that technical change increased output by approximately one per cent per year between 1943 and 1950. Using some of the earlier data, Maurizi adjusted the dentist time-input by age of dentists and derived a second estimate of increased output due to technical change of .84 per cent per year.

(Maurizi also estimated a production function based upon cross-section data from the 1961 Survey of Dental Practice. The estimated function is:

$$\log VPD = .6279 + .466 \log AUX + .77 \log HRD + .254 \log CHR$$

where VPD = annual patient visits per dentist; AUX = number of auxiliary personnel employed by the dentist; HRD = annual hours worked by the dentist; and CHR = number of chairs in the office.) Alex Maurizi, Economic Essays on the Dental Profession, Iowa City, Iowa: College of Business Administration, The University of Iowa, 1969.

Another study estimated the time saved, hence additional caries filled and bridges placed, of using high speed cutting equipment. "The total theoretical saving of dentists' time from the use of high speed equipment is, therefore, the equivalent of 1741 dentists (over the period 1950 to 1975)." Assuming (among other things) that the number of dentists in 1975 were to be 115,000, then this savings in time would represent a 1.5 average annual increase in dentist productivity. American Council on Education, The Survey of Dentistry, Washington, D.C.: American Council on Education, 1961, p. 478.

These findings must be considered highly tentative due to data limitations, but they suggest an annual productivity increase due to technological change of about one per cent.

[3]Studies of dental practices in Canada have yielded similar results. Hall found that Canadian dentists who use assistants see more patients per day. Those dentists surveyed who employed no assistants averaged 10 to 12 patients per day; dentists with one full-time assistant averaged 15 to 17 patients per day; and dentists using two to four full-time assistants saw 16 to 20 patients per day. Although Hall did not collect gross income data, he did find that those dentists with higher net incomes tended to make greater use of auxiliaries than did those dentists who earned less. Oswald Hall, Utilization of Dentists in Canada, Royal Commission on Health Services, Queen's

Printer, Ottawa, 1965.

[4]For a summary of the literature in this area see D. B. Ast, "Changes in Oral Health Delivery Systems Resulting from Implementation of More Efficient Preventative Measures and Greater Delegation of Responsibilities to Auxiliaries," Position Papers on an Improved Oral Care System, 1972 (to be published).

[5]S. Lotzkar, D. W. Johnson, and M. B. Thompson, "Experimental program in expanded functions for dental assistants: phase 3 experiment with dental teams," Journal of the American Dental Association, Vol. 82, p. 1067 (1967).

[6]P. E. Hammons and H. C. Jamison, "Expanded functions for dental auxiliaries," Journal of the American Dental Association, Vol. 75, p. 658 (1967).

[7]P. E. Hammons and H. C. Jamison, "Increasing the production of dental auxiliaries," Journal of the American College of Dentists, Vol. 35, p. 154 (1968).

[8]P. E. Hammons, H. C. Jamison, and L. L. Wilson, "Quality of service provided by dental tyerapists in an experimental program at the University of Alabama," Journal of the American Dental Association, Vol. 82, p. 1060 (1971).

[9]Joseph Abramowitz, "Expanded functions for dental assistants: a preliminary study," Journal of the American Dental Association, Vol. 72, p. 386 (February 1966).

[10]D. A. Soricelli, "Practical Experience in Peer Review Controlling Quality in the Delivery of Dental Care,"

American Journal of Public Health, Vol. 61, p. 2046 (October 1971).

[11]W. E. Ludwig, E. O. Schoebelen, and R. J. Knoedler, Greater Utilization of Dental Technicians, I. Report of Training, U.S. Naval Training Center, Dental Research Facility, Great Lakes, Illinois, 1963.

[12]W. E. Ludwig, E. O. Schoebelen, and R. J. Knoedler, Greater Utilization of Dental Technicians, II. Report of Clinical Tests, U.S. Naval Training Center, Dental Research Facility, Great Lakes, Illinois, 1964.

[13]K. M. Baird, D. B. Shillington, and D. H. Protheroe, "Pilot study on the advanced training and employment of auxiliary dental personnel in the Royal Canadian Dental Corps: preliminary report," Canadian Dental Association Journal, Vol. 28, p. 627 (October 1962).

[14]Sir John P. Walsh, "The Dental Nurse," American College of Dentists Journal, Vol. 32, p. 62 (1965).

[15]G. H. Leatherman, "Survey of Auxiliary Dental Personnel," International Dental Journal, Vol. 19, p. 49 (1969).

[16]G. Th. E. R. Arnold, "The Dental Assistant, the Clinical Chairside Assistant and the Dental Hygienist as Members of the Dental Team in General Practice," International Dental Journal, Vol. 19, p. 12 (1969).

[17]World Health Organization, Report of the Expert Committee on Dental Auxiliary Personnel, Technical Report Series No. 163, Geneva, 1969.

[18]Michigan Compiled Laws Annotated § 338.209.

[19]The Minnesota dental practice act expressly delegates rule-making authority to the licensing board: "[The] dentist shall permit such unlicensed assistant to perform only those acts which he is authorized to delegate to unlicensed assistants by the board of dentistry. The board may permit differing levels of dental assistance upon recognized education standards, approved by the board, for the training of dental assistants." Minnesota Statutes Annotated § 150A.10 (Sub. 2).

[20]Some state dental practice acts expressly exclude members of dental school faculties from eligibility for membership on the state examining board.

[21]D. W. Johnson and S. Bernstein, "Classification of States Regarding Expanding Duties for Dental Auxiliaries and Selected Aspects of Dental Licensure," American Journal of Public Health, Vol. 62, p. 208 (February 1972).

[22]William E. Brown, "Increasing productivity and reducing disease. The dental health team: potential role of auxiliaries," Journal of the American Dental Association, Vol. 75, p. 882 (October 1967).

[23]Hall, op. cit.